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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Joel Kindem

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EXAMINER

LEE, SHUN K

ART UNIT

PAPER NUMBER

2884

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/776,645	KINDEM ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Shun Lee	2884	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 30 October 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-7,9-14,16-26,29 and 31-52 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7,9-14,16-26,29 and 31-52 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Specification*

1. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1, 3, 5, 6, 11, 31, 36, 37, 39-41, 43, 45-47, and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freund *et al.* (WO 02/25311 A1) in view of O'Kane Sr. *et al.* (US 2002/0060300).

It should be noted that US Patent 6,894,282 B2 (Freund *et al.*) corresponds to WO 02/25311 A1 (Freund *et al.*).

In regard to claim 1, Freund *et al.* disclose (Figs. 5 and 6) a scintillator assembly, comprising:

- (a) an array of scintillator material comprising plural pixels (4) of separated scintillator material, each having outer surfaces of a first shape, and a bridge (*i.e.*, "base plate"; US 6,894,282 column 4, lines 57-66) holding together the plural separated pixels (4) in a specific geometry; and
- (b) a preformed reflector (5), having plural inner surfaces which each mate with said array of plural separated pixels (4), to contain each of said pixels (4) of scintillator material at least partly within said pre-formed reflector (5).

While Freund *et al.* also disclose (US 6,894,282 column 2, lines 58-65) a plastic reflector, the assembly of Freund *et al.* lacks an explicit description that the plastic reflector comprises polyethylene. Since Freund *et al.* do not disclose and/or require a specific plastic, one having ordinary skill in the art at the time of the invention would reasonably interpret the unspecified plastic of Freund *et al.* as a conventional plastic which does not require further description. Further, O'Kane Sr. *et al.* teach (paragraphs 46-49) that plastics comprise polyethylene. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention that the unspecified plastic reflector material in the assembly of Freund *et al.* comprises a known plastic material (*e.g.*, polyethylene).

In regard to claim **37**, Freund *et al.* disclose (Figs. 5 and 6) a method, comprising:

- (a) pre-forming a reflector array (5) having plural individual pixels, each of a specified shape having specified shaped inner surfaces; and
- (b) attaching said reflector (5) to an array of scintillator material formed of separated pixels (4) of scintillator material that are held together, each of said separated pixels shaped to fit within one of said individual pixels of said reflector array (5).

While Freund *et al.* also disclose (US 6,894,282 column 2, lines 58-65) a plastic reflector, the method of Freund *et al.* lacks an explicit description that the plastic reflector comprises polyethylene. Since Freund *et al.* do not disclose and/or require a specific plastic, one having ordinary skill in the art at the time of the invention would reasonably interpret the unspecified plastic of Freund *et al.* as a conventional plastic which does not require further description. Further, O'Kane Sr. *et al.* teach (paragraphs 46-49) that plastics comprise polyethylene. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention that the unspecified plastic reflector material in the method of Freund *et al.* comprises a known plastic material (e.g., polyethylene).

In regard to claim **3** (which is dependent on claim 1) and claim **39** (which is dependent on claim 37), Freund *et al.* also disclose (US 6,894,282 column 4, line 66 to column 5, line 10) an adhesive material, bonding said scintillator material within said pre-formed reflector.

In regard to claims **5** and **6** (which are dependent on claim 1) and claims **40** and **41** (which are dependent on claim 37), Freund *et al.* also disclose (Figs. 5 and 6) an opening in the preformed reflector (5), at a specified location, corresponding to a specified location on the scintillator material, wherein said opening is at a location of an exit window on the scintillator material.

In regard to claim **11** which is dependent on claim 1, Freund *et al.* also disclose (Figs. 5 and 6) a plurality of openings in the pre-formed reflector (5), at locations of a plurality of exit faces for the scintillator material.

In regard to claim **31** which is dependent on claim 1, Freund *et al.* also disclose (US 6,894,282 column 4, lines 10-16) titanium dioxide as an additive to the reflector material.

In regard to claim **36** which is dependent on claim 1, Freund *et al.* also disclose (US 6,894,282 column 4, lines 10-16) that said preformed reflector is formed by injection molding.

In regard to claim **43** which is dependent on claim 37, Freund *et al.* also disclose (Figs. 5 and 6) that said reflector (5) has a specified shape to hold said separated pixels of said scintillator material.

In regard to claim **45** (which is dependent on claim 1) and claim **47** (which is dependent on claim 37), Freund *et al.* also disclose (Figs. 5 and 6) that the preformed reflector (5) has a plurality of continuous surfaces which extend from a first portion on the scintillator material near a first end thereof, to a second portion on the scintillator

material near a second opposite end thereof, and continuously extends between said first and second portions.

In regard to claim **46** which is dependent on claim 37, Freund *et al.* also disclose (US 6,894,282 column 4, lines 10-16) using said reflector to reflect scintillation photons back into said scintillator material.

In regard to claim **51** which is dependent on claim 1, Freund *et al.* also disclose (Figs. 5 and 6) that said preformed reflector (5) has, for each pixel, four completely solid walls, completely surrounding walls of said separated pixel.

5. Claims 2, 4, 12, 19, and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freund *et al.* (WO 02/25311 A1) in view of O'Kane Sr. *et al.* (US 2002/0060300) as applied to claims 1 and 37 above, and further in view of Such *et al.* (US 2001/0002699).

In regard to claims **2** and **4** (which are dependent on claim 1), claim **12** (which is dependent on claim 1), claim **19** (which is dependent on claim 1), and claim **38** (which is dependent on claim 37), the modified assembly and method of Freund *et al.* lacks that the pre-formed reflector is formed of multiple flexible pieces with ridges within said preformed reflector, wherein said inner surfaces of said pre-formed reflector press against outer surfaces of said scintillator material to hold said scintillator material within said preformed reflector with at least one air gap between adjacent scintillator material surfaces by press fitting. Such *et al.* teach (paragraphs 8 and 12; Fig. 2) to press fit scintillator material (23) into a preformed reflector (21, 22) having ridges or protrusions (*i.e.*, spaced apart wire elements; paragraph 9) forming air gaps, in order to

manufacture with a high precision and in large numbers at an acceptable cost.

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to form the reflector in the modified assembly and method of

Freund *et al.* from spaced apart wire elements which allows press fitting assembly, in

order to manufacture with a high precision and in large numbers at an acceptable cost.

6. Claims 7, 20, 21, 29, 35, and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freund *et al.* (WO 02/25311 A1) in view of O'Kane Sr. *et al.*

(US 2002/0060300) as applied to claims 1, 5, and 40 above, and further in view of DiFilippo (US 6,078,052).

In regard to claim 7 (which is dependent on claim 5), claims 20 and 21 (which are dependent on claim 1), and claim 42 (which is dependent on claim 40), the modified assembly and method of Freund *et al.* lacks a light guide (*e.g.*, a wavelength shifting optical fiber). However, wavelength shifting optical fibers are well known in the art. For example, DiFilippo teaches (column 3, line 21 to column 4, line 8) to provide wavelength shifting optical fibers in order to enhance collection efficiency. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide wavelength shifting optical fibers in the modified assembly and method of Freund *et al.*, in order to enhance collection efficiency.

In regard to claim 29 (which is dependent on claim 1) and claim 35 (which is dependent on claim 1), the modified assembly of Freund *et al.* lacks an explicit description of specific reflector fillers or additives (*e.g.*, organic optical brightening agents). However, wavelength shifting is well known in the art. For example, DiFilippo



teaches (column 3, line 21 to column 4, line 8) to provide wavelength shifting optical fibers (*i.e.*, organic optical brightening agents) in order to enhance collection efficiency. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide organic optical brightening agents (*e.g.*, wavelength shifting optical fibers) in the modified assembly of Freund *et al.*, in order to enhance collection efficiency.

7. Claims 9, 10, and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freund *et al.* (WO 02/25311 A1) in view of DiBianca *et al.* (US 4,429,227).

In regard to claims 9 and 10, Freund *et al.* disclose (Figs. 5 and 6) a scintillator assembly, comprising:

- (a) a scintillator material (4), having outer surfaces of a first shape; and
- (b) a preformed reflector (5), having inner surfaces which each mate with said first shape to contain said scintillator material (4) at least partly within said pre-formed reflector (5).

The assembly of Freund *et al.* lacks providing at least one air gap between a wall of the reflector and a surface of the scintillator material with a spacer formed by a protrusion. DiBianca *et al.* teach (column 5, lines 9-34) to provide at least one air gap between a wall of the reflector and a surface of the scintillator material with a bonding material (100 in Fig. 5), in order to enhance light collection efficiency. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide at least one air gap between a wall of the reflector and a surface of the scintillator material

with a bonding material as a spacer in the assembly of Freund *et al.*, in order to enhance light collection efficiency.

In regard to claim **44**, Freund *et al.* disclose (Figs. 5 and 6) a method, comprising:

- (a) pre-forming a reflector (5) of a specified shape having specified shaped inner surfaces; and
- (b) attaching said reflector (5) to a scintillator material (4) of a shape that fits within said inner surfaces.

The method of Freund *et al.* lacks forming at least one air gap between adjacent scintillator material surfaces and the reflector. DiBianca *et al.* teach (column 5, lines 9-34) to provide at least one air gap between a wall of the reflector and a surface of the scintillator material with a bonding material (100 in Fig. 5), in order to enhance light collection efficiency. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to form at least one air gap between adjacent scintillator material surfaces and the reflector in the method of Freund *et al.*, in order to enhance light collection efficiency.

8. Claims 13, 14, 17, 18, and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freund *et al.* (WO 02/25311 A1) in view of O'Kane Sr. *et al.* (US 2002/0060300) as applied to claim 1 above, and further in view of Possin *et al.* (US 6,707,046).

In regard to claims **13** and **50** (which are dependent on claim 1), claim **14** (which is dependent on claim 1), claim **17** (which is dependent on claim 1), and claim **18** (which

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is dependent on claim 1), the modified assembly of Freund *et al.* lacks that said first shape has an exit window smaller than the area of a face of the pixel upon which each said exit window is defined, wherein said first shape is other than a rectangular parallelepiped with at least one exit face that is not perpendicular to adjacent sidewalls of the material and varies in cross-sectional area in at least one direction by having a first portion at one end which is substantially constant and rectangular in cross section, and having a second end which reduces in area between said substantially constant cross-section and an end section which forms an exit window of the scintillator material. However, scintillator exit windows are well known in the art. For example, Possin *et al.* teach (column 5, line 65 to column 6, line 54) to provide scintillator exit windows smaller than the area of a pixel face so as minimize cross talk. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide scintillator exit windows smaller than the area of a pixel face in the modified assembly of Freund *et al.*, in order to minimize cross talk.

9. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Freund *et al.* (WO 02/25311 A1) in view of O'Kane Sr. *et al.* (US 2002/0060300) as applied to claim 1 above, and further in view of Hoffman *et al.* (US 6,087,665).

In regard to claim 16 which is dependent on claim 1, the modified assembly of Freund *et al.* lacks that the scintillator material comprises different scintillator materials. However, scintillator detectors are well known in the art. For example, Hoffman *et al.* teach (column 4, lines 28-33) to provide different scintillator materials so as optimize specific detector characteristics. Therefore it would have been obvious to one having

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ordinary skill in the art at the time of the invention to provide different scintillator materials in the modified assembly of Freund *et al.*, in order to optimize specific detector characteristics.

10. Claims 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freund *et al.* (WO 02/25311 A1) in view of DiBianca *et al.* (US 4,429,227) as applied to claim 9 above, and further in view of DiFilippo (US 6,078,052).

In regard to claims **22** and **23** which are dependent on claim 9, the modified assembly of Freund *et al.* lacks a light guide (e.g., a wavelength shifting optical fiber). However, wavelength shifting optical fibers are well known in the art. For example, DiFilippo teaches (column 3, line 21 to column 4, line 8) to provide wavelength shifting optical fibers in order to enhance collection efficiency. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide wavelength shifting optical fibers in the modified assembly of Freund *et al.*, in order to enhance collection efficiency.

11. Claims 24 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freund *et al.* (WO 02/25311 A1) in view of O'Kane Sr. *et al.* (US 2002/0060300) as applied to claim 1 above, and further in view of Hoffman (US 6,479,824).

In regard to claim **24** (which is dependent on claim 1) and claim **34** (which is dependent on claim 1), the modified assembly of Freund *et al.* lacks an explicit description of specific reflector fillers or additives (e.g., scintillating material). However, additives for scintillator reflectors are well known in the art. For example, Hoffman teaches (column 4, line 55 to column 5, line 2) to provide scintillating material for the

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reflector fillers or additives so as enhance quantum efficiency. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide scintillator reflector additives (e.g., scintillating material) in the modified assembly of Freund *et al.*, in order to enhance quantum efficiency.

12. Claims 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freund *et al.* (WO 02/25311 A1) in view of DiBianca *et al.* (US 4,429,227) as applied to claim 9 above, and further in view of O'Kane Sr. *et al.* (US 2002/0060300).

In regard to claim 25 (which is dependent on claim 9) and claim 26 (which is dependent on claim 9), Freund *et al.* also disclose (US 6,894,282 column 4, lines 10-16) titanium dioxide as an additive to the reflector material. While Freund *et al.* also disclose (US 6,894,282 column 2, lines 58-65) a plastic reflector, the modified assembly of Freund *et al.* lacks an explicit description that the plastic reflector comprises polyethylene. Since Freund *et al.* do not disclose and/or require a specific plastic, one having ordinary skill in the art at the time of the invention would reasonably interpret the unspecified plastic of Freund *et al.* as a conventional plastic which does not require further description. Further, O'Kane Sr. *et al.* teach (paragraphs 46-49) that plastics comprise polyethylene. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention that the unspecified plastic reflector material in the modified assembly of Freund *et al.* comprises a known plastic material (e.g., polyethylene).

13. Claims 32 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freund *et al.* (WO 02/25311 A1) in view of O'Kane Sr. *et al.* (US 2002/0060300) as

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applied to claim 1 above, and further in view of Venkataramani *et al.*

(US 2002/0181647).

In regard to claims **32** and **33** which are dependent on claim 1, the modified assembly of Freund *et al.* lacks an explicit description of specific reflector fillers or additives (e.g., hafnium or hafnium oxide). However, additives for scintillator reflectors are well known in the art. For example, Venkataramani *et al.* teach (paragraphs 27-31) to provide scintillator reflector additives such as hafnium or hafnium oxide so as to obtain scintillator reflectors having desired x-ray attenuation properties. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide scintillator reflector additives (e.g., hafnium or hafnium oxide) in the modified assembly of Freund *et al.*, in order to obtain a scintillator reflector having desired properties (e.g., attenuation of x-rays).

14. Claims 48, 49, and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freund *et al.* (WO 02/25311 A1) in view of O'Kane Sr. *et al.* (US 2002/0060300) as applied to claims 1 and 37 above, and further in view of Venkataramani *et al.* (US 6,361,735).

In regard to claims **48** and **49** (which are dependent on claim 1) and claim **52** (which is dependent on claim 37), the modified assembly and method of Freund *et al.* lacks that said array of scintillator material which is held together by said bridge is a two-dimensional array (e.g., a 4X4 array). Venkataramani *et al.* teach (column 3, line 14 to column 4, line 64) that an array of scintillator material for a CT scanning system can be formed as a one dimension array or a two dimensional array. Therefore it would

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have been obvious to one having ordinary skill in the art at the time of the invention to form the array of scintillator material in the modified assembly and method of Freund *et al.* as a two-dimensional array (e.g., a 4X4 array), in order to achieve a desired type of CT scanning system.

### ***Response to Arguments***

15. Applicant's arguments filed 30 October 2006 have been fully considered but they are not persuasive.

Applicant argues (last paragraph on pg. 14 to second paragraph on pg. 15 of remarks filed 30 October 2006) that the use of epoxy resin is certainly not a plastic. Examiner respectfully disagrees. Freund *et al.* state (US 6,894,282 column 2, lines 58-65) that "In a preferred embodiment of the invention, the reflector part is of one-part design, i.e., unitary or seamless, for example as an injection-molded or die-cast part, which is preferably produced from plastic, in particular a plastic containing an optically reflective filler. ... ". Thus Freund *et al.* expressly teach a plastic reflector. Further, Freund *et al.* state (US 6,894,282 column 4, lines 10-16) that "Since the reflector part 5, which is designed as an injection-molded or die-cast part, is formed from an optically reflective material, from epoxy resin treated with titanium oxide in the case of the exemplary embodiment described ... ". The key phrase is "exemplary embodiment". Thus it is clear that the express disclosure of a plastic reflector is not limited to only an "exemplary embodiment" of "epoxy resin". Since Freund *et al.* do not disclose and/or require a specific plastic, one having ordinary skill in the art at the time of the invention would reasonably interpret the unspecified plastic of Freund *et al.* as a conventional

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plastic which does not require further description. Further, O'Kane Sr. *et al.* teach (paragraphs 46-49) that plastics comprise polyethylene. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention that the unspecified plastic reflector material in the assembly of Freund *et al.* comprises a known plastic material (e.g., polyethylene).

In response to applicant's argument (last paragraph on pg. 15 of remarks filed 30 October 2006) that O'Kane Sr. *et al.* is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, O'Kane Sr. *et al.* is in the field of applicant's endeavor (i.e., radioisotope cameras comprising scintillators). O'Kane Sr. *et al.* state (paragraphs 2 and 3) that "The present invention relates to the field of radioisotope cameras. ... Gamma-ray or scintillation cameras, also known as "Anger cameras" are widely used in medicinal applications to monitor the progress or distribution of a gamma-ray emitting nuclide introduced into a patient. ... ". O'Kane Sr. *et al.* was cited for teaching that the genus of plastics include the specie of polyethylene. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention that the unspecified plastic reflector material in the assembly of Freund *et al.* comprises a known plastic material (e.g., polyethylene).



Applicant argues (second and third paragraphs on pg. 15 of remarks filed 30 October 2006) that the cited prior art do not teach or suggest a titanium oxide additive and/or scintillator material additive. Examiner respectfully disagrees. First it is noted that applicant also argues that "For example, claim 31 defines titanium oxide as an additive to the polyethylene, to make it whiter", "Claim 24 defines a scintillator material added to the polyethylene", and "Claim 31 was rejected further over PCT Publication Number WO 02/25311 in view of O'kane, SR. et al., but there is absolutely no teaching in O'kane, SR. et al. of adding a scintillator material to the polyethylene". However, currently amended dependent claim 24 recites "further comprising a scintillator material as an additive to the reflector material of said preformed reflector" and currently amended dependent claim 31 recites "further comprising titanium dioxide as an additive to said polyethylene". Further, Freund *et al.* state (US 6,894,282 column 4, lines 10-16) that "Since the reflector part 5, which is designed as an injection-molded or die-cast part, is formed from an optically reflective material, from epoxy resin treated with titanium oxide in the case of the exemplary embodiment described ... ". Thus Freund *et al.* expressly teach that at least one of inorganic or organic materials such as titanium dioxide as an additive to the reflector material of a pre-formed reflector. In addition, Hoffman teaches (column 4, line 55 to column 5, line 2) to provide scintillating material for the reflector fillers or additives so as to enhance quantum efficiency. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide scintillator reflector additives (e.g., scintillating material) in the assembly of Freund *et al.*, in order to enhance quantum efficiency.

Applicant argues (last paragraph on pg. 16 to second paragraph on pg. 18 of remarks filed 30 October 2006) that a person having ordinary skill in the art would obtain no guidance from DiBianca *et al.* why a gap should be formed. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). In addition, DiBianca *et al.* state (column 5, lines 9-34) that "In the preferred embodiment a specular reflector, which comprises an air gap longer than a wavelength of light followed by a highly reflective metallic surface, such as, for example silver or aluminum coated with magnesium fluoride or silicon oxide, is located at the end portions of the scintillator (which face the ceramic sections 30, 31), and on the side surfaces of the scintillator (which face the collimator plates). In fact, the ceramic sections (covered with the desired metallic surface) and the collimator plates serve as the reflective surfaces of these reflectors. The face of the scintillator, that is, the surface facing the detector window, is highly polished and may carry a reflective coating, which may be a specular reflector such as, for example, silver, aluminum, gold, or a diffuse reflector such as, for example, magnesium oxide, titanium oxide, barium oxide or the like. The reflector may be either directly deposited or mounted on a thin, X-ray transparent member so as to allow an air gap to be present.

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Thus, light emitted by the scintillator in response to X-radiation will be directed largely towards the photoresponsive means". Thus DiBianca *et al.* teach to provide at least one air gap between a wall of the reflector and a surface of the scintillator material with a bonding material (100 in Fig. 5), in order to enhance light collection efficiency.

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide at least one air gap between a wall of the reflector and a surface of the scintillator material with a bonding material as a spacer in the assembly of Freund *et al.*, in order to enhance light collection efficiency.

### **Conclusion**

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.


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17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shun Lee whose telephone number is (571) 272-2439. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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